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*Goitre and the Psychoses.* By NORMAN ROUTH PHILLIPS, M.D.Brux., M.R.C.S., L.R.C.P.Lond., St. Andrew's Hospital, Northampton. Awarded Second Prize in the Bronze Medal Competition.

THAT there is some relationship between goitre and the psychoses is beyond all question. We have only to recall the mental syndromes of Graves' disease and endemic cretinism—goitre occurs in all but a few exceptional cases of the former, and in about 50 *per cent.* of the latter. Moreover it is by no means uncommon to find goitre in adult myxœdema.

In this article I propose to show that the rôle played by goitre in the psychoses is more extended than is indicated by the examples just mentioned. I shall also endeavour to explain the nature of this

association of goitre and insanity, and, finally, I shall indicate the lines upon which the treatment of these cases should be based.

Systematic examination of the thyroid demonstrates the fact that enlargement of the gland is of fairly frequent occurrence in asylums, especially in female cases.

It appears, however, that endemic goitre is more often associated with the psychoses than is the sporadic form. Moreover, the enlargement of the thyroid in the former case is much more evident, frequently leading to great disfigurement.

I once had the advantage of visiting the wards of the Bel Air Asylum near Geneva, and I was greatly impressed by the high percentage of patients suffering from goitre—36 *per cent.* for both sexes. The goitrous enlargement had in many of the cases attained to an enormous size.

Various authors have drawn attention to the frequency with which the goitrous become insane; others have remarked on the eccentricities of character and enfeeblement of the intellectual faculties in districts where goitre and cretinism is endemic. In particular I might mention the work of Marzocchi and Antonini. As a result of much careful observation the last-named writers came to the following conclusions:

(1) The goitrous, including congenital cases, are eight times more susceptible to insanity than those not afflicted with thyroid enlargement (*i.e.*, as far as the Province of Bergamo is concerned). Moreover, if one deducts all the congenital cases (cretins, etc.) the goitrous more often become insane than other people.

(2) The curable psychoses do not furnish any difference in the percentage of recoveries, whether the case be goitrous or not.

(3) People not afflicted with goitre, belonging to a district where goitre is endemic, are no more subject to contract mental maladies than those coming from a country where the affection is not prevalent.

Up to a few years ago no satisfactory explanation was forthcoming to account for this association of goitre with the psychoses. It was generally believed that goitre did not affect the thyroid secretion. Within recent years, however, as a result of much clinical, pathological, and experimental investigation, the whole subject of goitre has been revised, and a number of observers have produced evidence to show that the goitrous lesion affects the secreting epithelium in such a way as to cause signs of either hypo- or hyperthyroidism, or the two conditions may exist side by side in the same subject—thyroid instability.

These conclusions are of the utmost importance, as the mere fact of goitre being associated with either thyroid insufficiency or excess places this affection on a footing with the well-known diseases of the thyroid mentioned at the commencement of this article, *viz.*, Graves' disease,

cretinism, and myxœdema, whose relation to the psychoses is an incontestable fact.

It is now possible to divide all the various forms of goitre into two main groups, *viz.*, Group I, those forms which produce hypothyroidism; and Group II, those producing hyperthyroidism.

Group I. Hypothyroidism occurs:

(a) Sometimes as a later stage in parenchymatous goitre, the initial activity of the gland being followed by a phase of secretory exhaustion.

(b) In chronic colloid goitre—as a result of the flattening and atrophy of the epithelial cells from distension of the vesicles with excess of colloid material.

(c) In adenomatous, fibrous, and cystic goitres, probably as a result of mechanical interference with the proper functions of the gland.

(d) Sometimes as a late stage in Graves' disease from fibrous degeneration and atrophy of the epithelium.

Group II. Hyperthyroidism occurs:

(a) In the early stages of parenchymatous goitre as a result of the hypertrophy of the gland which arises in response to a call for increased thyroid secretion.

(b) In Graves' disease where there is active hypertrophy and proliferation of the epithelial cells, with the formation of new vesicles lined with cubical cells and containing colloid.

(c) In a certain proportion of old colloid goitres the atrophied epithelium taking on renewed growth, with the same active cell-proliferation and formation of new vesicles mentioned in the last variety.

Rogers holds the view that "An increase in the size of the gland seems the regular or natural first stage in all acquired thyroid diseases." This opinion is particularly interesting when one takes into consideration the frequency with which pathological changes have been found in the thyroid gland in the insane by many observers.

The frequent association of hypothyroidism with goitre referred to above is worth noting, as the mistake is often made that enlargement of the thyroid gland necessarily points to hyperfunction. Even some of the most prominent observers continue to quote the weight of the gland, implying that if it be above normal hyperthyroidism is indicated and *vice versa*.

*Auto-intoxication.*—Let us consider in more minute detail how the brain may be affected by the goitrous lesion.

The various endocrinic glands, in addition to their specific functions, pour into the blood-plasma certain chemical substances called hormones, which are endowed with the important function of regulating metabolism—one group of hormones exercising an augmentor, the other a

retarding influence. Thus an equilibrium or balance is established, the maintenance of which is essential to health.

We are justified in assuming that a lesion of an important organ, such as the thyroid gland, resulting in diminution or excess of thyroid secretion would produce disorganisation of the delicate hormonal balance and so induce a state of auto-intoxication.

Now, as Lugaro emphasises, the brain is particularly susceptible to the action of poisons, and reacts to those which are produced in the organism itself not less intensely than it does to those derived from outside.

#### INFLUENCE OF THE NERVOUS SYSTEM ON THE THYROID SECRETION.

Increasing interest in this important subject has been manifested of late in consequence of the close relationship which is known to exist between the thyroid gland and the nervous system.

The nerve supply of the gland is derived from the sympathetic system and the vagus. The sympathetic nerves have been proved not only to influence the glandular secretion, but also to regulate and control the delicate inter-relationships existing between the various endocrine glands.

The influence of the higher nerve centres on the thyroid secretion is shown by the fact that emotional states—*e.g.*, fear, anger, anxiety—are capable of producing states of hyperthyroidism.

The following statistics are interesting as showing the frequent association of endemic goitre with the psychoses :

Of 291 patients examined by Brissard at the Bel Air Asylum, Geneva, 106 were found to be goitrous (44 males and 62 females, or 36 *per cent.* for both sexes). These figures are remarkable when compared with the statistics furnished by the Recruiting Office for the Canton, the proportion of goitrous as indicated by the latter being only 5 *per cent.* The 106 goitrous patients included 71 cases of dementia præcox, 18 cases congenitally weak-minded, 8 cases of senile dementia, and 4 of manic-depressive insanity. The frequency of goitre in dementia præcox and in congenital idiocy is significant. Out of a total number of 149 cases of dementia præcox 71 were goitrous, *i.e.*, 49 *per cent.*, and out of a total of 37 cases of congenital idiocy 18 were goitrous, *i.e.*, 48 *per cent.* Hardly less interesting are the statistics drawn up by Schranz at the Hall Asylum in the Tyrol, and quoted by Brissard.

Of 277 patients under observation Schranz found 68 goitrous, *i.e.*, 24.5 *per cent.*, as compared with 15 *per cent.* for the rest of the population. These 68 goitrous patients included 45 cases of dementia præcox, 13 of mania, 7 of congenital idiocy, and 3 of epilepsy. The large proportion of cases of dementia præcox is again worthy of note.

## CLINICAL CASES.

A word is necessary to explain why I have included cases presenting exophthalmos (*i.e.*, cases of Graves' disease) in the following table. Experience has shown me that all cases of goitre, both of the "simple" and of the "exophthalmic" type, are liable to undergo changes, not only in the size and shape of the thyroid gland, but also in the signs and symptoms by which they are accompanied (whether these latter be of a somatic or mental character).

Thus a case of apparently simple goitre may sooner or later develop all or many of the signs indicative of Graves' disease, *e.g.*, exophthalmos, tremors, palpitation, etc., as well as the mental instability so characteristic of that disease; a case of Graves' disease, too, is liable to undergo changes, *e.g.*, the exophthalmos, tremors, palpitation, etc., may disappear—so that if one were not acquainted with the history of the case one might be tempted to make a diagnosis of "simple goitre."

The following table summarises the observations made by me on twenty-four insane patients who were affected with goitre. Two hundred patients were examined at St. Andrew's Hospital, Northampton, so that the actual proportion of goitrous was 12 per cent.

No. of case.	Psychosis.	Lobes affected.	Pulse rate.	Systolic blood-pressure.	Exophthalmos.
1	Melancholia . . . . .	M + R	96	148	S
2	Paranoia . . . . .	R + L	72	118	—
3	Dementia præcox . . . . .	L	60	120	—
4	Senile melancholia . . . . .	R	80	176	—
5	Mania . . . . .	R + L	70-120	150	—
6	Manic-depressive . . . . .	M	72	140	—
7	Melancholia . . . . .	M	84	140	—
8	Manic-depressive . . . . .	R	0	0	—
9	Mania . . . . .	G	64	192	—
10	Manic-depressive . . . . .	R + L	88	130	—
11	Paranoia . . . . .	R + M	0	0	—
12	Dementia præcox . . . . .	L + R	80	142	—
13	Dementia præcox . . . . .	M	88	130	—
14	Mania . . . . .	R + M	76	120	S
15	Dementia præcox . . . . .	G	84	160	—
16	Manic-depressive . . . . .	R	0	0	+
17	Involutional melancholia . . . . .	R + L	0	0	+
18	Manic-depressive . . . . .	R + L	120	190	+
19	Melancholia . . . . .	R + M	72	112	—
20	Manic-depressive . . . . .	M + R	74	138	—
21	Mania . . . . .	M	90	160	—
22	Paranoia . . . . .	G	88	140	—
23	Melancholia . . . . .	R + L	98	166	+
24	Melancholia . . . . .	L	92	142	+

*Explanation of abbreviations.*—M = Middle lobe. R = Right lobe. L = Left lobe. G = General enlargement of the thyroid gland. S = Slight. + = Present — = Not present. 0 = Not obtained.

It will be seen that out of 24 cases of goitre under observation no less than 17 suffered from manic-depressive insanity or from the melancholia of involution, *i. e.*, 70 *per cent.* of the whole number. Of the remaining 7, 4 were cases of dementia præcox, and 3 of paranoia.

CASE 5.—Æt. 47, was admitted October, 1912.

*Family history.*—Father insane—chronic melancholia.

*Physical examination.*—Slight enlargement of the thyroid; exophthalmos; palpitation; pulse-rate 100; some emaciation; poor general health.

*Mental.*—She was restless, talkative, memory defective, attention distractible, emotional, irritable, apprehensive. She was lacking in concentration; complained of headache and noises in the head; troubled with insomnia, frequently asking for drugs.

January, 1913, she was discharged.

September 22nd, she was again admitted, suffering from mania. She had been over-indulging in drugs and alcohol. The physical and mental symptoms were similar to those mentioned above.

October 19th, 1914: Transferred elsewhere.

November 1st, 1915: Readmitted into this Hospital suffering from chronic mania.

*Present state: Physical.*—There is slight general enlargement of the thyroid, frequent attacks of tachycardia, pulse varies between 70–120, systolic blood-pressure 150, fine tremors of the hands, moisture of the skin, slight exophthalmos.

*Mental.*—She is very emotional, with frequently changing moods; she is irritable and at times noisy and abusive; occasionally she is violent to the nurses; she is very verbose with flight of ideas; attention is distractible; she writes endless illegible nonsense on scraps of paper and leaves torn out of books; she is very restless; memory is impaired; she is untidy and fantastic in dress; she is apprehensive with delusions of persecution.

This case may be considered a typical one of hyperthyroidism with characteristic mental symptoms. It will be noticed that all the psychic processes are affected, but it is the emotional sphere which is most profoundly disturbed, and which seems to dominate the whole personality. It is interesting to note that the thyroid gland has been styled by Léopold Lévi, “La Glande d’emotion.”

The frequent occurrence of mania, melancholia, and manic-depressive insanity in Graves’ disease led Parhon and others to think that exaggeration or perversion of the function of the thyroid gland plays an important rôle in the production of these psychoses as a rule, and pathological research has tended to confirm this view, but Parhon admits that hypothyroidism sometimes favours the development of melancholia.

The mental state of CASE 21 resembles in many ways the above. In addition, however, to the irritability, distractibility, restlessness, etc., she has auditory hallucinations and many changing delusions.

This patient has a large goitre about the size of more than half a

croquet-ball involving chiefly the middle lobe of the thyroid, the lateral lobes being also slightly involved. This goitre occasionally increases in size and is liable to cause some embarrassment to breathing, and some cyanosis due to pressure. There are periods when the cardio-vascular signs are accentuated—tachycardia, with a pulse-rate of 120 or more, and fine tremors of the fingers; there is no exophthalmos.

The family history is interesting, three sisters having goitre.

CASE 14 is chiefly interesting on account of the family history. She suffered from chronic mania with secondary dementia. There is a large goitre involving the isthmus and right lobe of the thyroid which has existed since childhood. (She is now 62.)

*Family history.*—One sister had goitre, and was also mentally deficient and died of diabetes. Another sister had goitre.

CASE 19.—Æt. 33. Admitted November 7th, 1917.

*Family history.*—One sister has a larger goitre. Maternal aunt (Case 17) goitrous. Mother died in an asylum.

Patient has a goitre of the shape and size of half a hen's egg, the long axis almost vertical, involving right lobe and isthmus.

She is suffering from melancholic stupor. There is a history of coitus interruptus.

CASE 1.—Æt. 43. Single. Admitted August 11th, 1917.

*Family history.*—Father, paternal grandfather, one brother and one sister goitrous. There is also a history of neuroses in family.

*Previous history.*—Since the commencement of menstruation (æt. 17) she has made repeated attempts to earn a living by teaching, etc. These endeavours invariably sooner or later led to a physical and nervous breakdown, with the following symptoms: "Violent throbbings in the neck and stomach," retching, vomiting, and dizziness, all accentuated by exertion. She was at the same time troubled with insomnia, was depressed and apprehensive. Six weeks previous to admission she developed delusions of hypnotic influence. An attempt to take her life by drowning resulted in certification.

*State on admission: Physical.*—Above average height; fairly nourished; fairly large goitre of the middle and right lobes. Heart, systolic murmur at apex; palpitation at times; slight exophthalmos.

*Mental.*—She was suffering from melancholia of the anxious type; emotional and agitated; delusion that she was hypnotised by an atheist; that in consequence she was possessed of the devil, her soul lost, and she was unworthy to live; auditory hallucinations; insomnia troublesome.

Later she became stuporose.

December 18th, 1917: Taken out by her father.

January 1st, 1918: Returned to this hospital in much the same state, physically and mentally, as on previous admission.

*Progress of case.*—The goitre remained prominent; she complained of throbbings in the neck and palpitation at times; easily tired. She was anxious and apprehensive, and dreaded the thought that the restlessness and insomnia might return; fleeting delusions.

A change to our sea-side home in the summer had a beneficial effect. She became more sociable and did some useful household work.

December 3rd, 1918: She improved sufficiently to return home, and she has maintained her improvement for six months.

CASE 6 is a typical case of "folie circulaire" of many years standing. Periods of depression are followed by periods of exaltation and restlessness, which in turn give place to intervals of comparative lucidity.

There is a goitre about the size of a walnut involving the thyroid isthmus.

*Heredity.*—Two brothers insane.

CASE 20.—Æt. 59. Admitted December 17th, 1917.

*Family history.*—Father, paternal aunt, and sister all had goitre. Husband developed goitre shortly after his wife's admission to this hospital.

*Previous history.*—She had had frequent attacks of depression, alternating with periods of mania, when she quite lost control of herself.

*State on admission: Physical.*—Goitre about the size of a small tangerine orange chiefly affecting the isthmus, but right lobe also involved. Pulse 98; heart irregular at times; systolic blood-pressure 138.

*Mental.*—Periods of excitement, when she was noisy, restless, impulsive, and violent, alternating with periods of depression, apprehension, and delusions of unworthiness and of culpability—she believed she would have to suffer torment and be killed. Under the influence of these ideas she had an uncontrollable impulse to scream loudly.

July 11th, 1918: She was discharged recovered after a visit to the sea.

It seems probable that the variety in the psychic syndromes which occurs in the recurrent, alternating, and circular types of insanity may be brought about by changes taking place in the enlarged thyroid gland, resulting in the association in the same subject of hyper- and hypothyroidism.

It may be convenient at this stage to compare the psychic syndrome of typical hyperthyroidism as seen in Graves' disease with the mental symptoms of typical hypothyroidism as seen in the myxœdema of adults. The acceleration of the mental processes in the former is in marked contrast with the retardation which obtains in the latter.

*Perception* is impaired in Graves' disease, and hallucinations are frequent.

*Memory* is impaired both in myxœdema and in Graves' disease.

*Attention* is difficult to obtain in myxœdema, whereas it is easy to obtain but difficult to fix in Graves' disease.

*Association of ideas* is very slow in myxœdema, whilst it is rapid in Graves' disease owing to the distractibility of attention.

*Emotions.*—The myxœdematous is dull and indifferent. In Graves' disease there is instability, irritability, and extreme irascibility.

*Capacity for mental work* is much impaired in myxœdema as a result of apathy and indifference. In Graves' disease the distractibility of



attention prevents concentration and perseverance—qualities which are essential to the performance of mental work.

*The reactions* are rapid in Graves' disease, whilst in myxœdema they are sluggish.

*Sleep*.—In myxœdema there is somnolence. In Graves' disease there is insomnia.

CASE 12.—Æt. 33. Dementia præcox. Admitted January, 1904.

*Previous history*.—She had been weak-minded for years.

On admission she was dull and listless, unoccupied and untidy.

*Progress*.—On one occasion she expressed her intention to commit suicide, but never attempted to do so. Occasionally she would mutter to herself. At times she was restless. The mental processes have gradually deteriorated.

*Physical state*.—There is a goitre affecting both lateral lobes of the thyroid—more marked on the left side. She has many of the stigmata of hypothyroidism—*e.g.*, stature small with poor development of the limbs, teeth deficient and defective, eyelashes scarce and blepharitis, disappearance of the outer third of eyebrows, shivering fits, temperature subnormal, cold extremities with cyanosis and chilblains, pulse small, 76, œdema of feet, easily fatigued. There is marked ichthyosis, the skin over the whole of the body being dry, with copious shedding of epidermic scales daily from the face and feet.

*Mental state*.—Expression vacant, she is listless and apathetic, and will sit in one position for hours gazing vacantly on the floor; attention is difficult to obtain and to fix; she has no regard for herself, her personal appearance, or her future; she is unoccupied, occasionally mutters to herself, association is sluggish—she never speaks on her own initiative, showing some incoherence and defective memory; movements catatonic in type.

This case is remarkable for the number of signs presented which indicate thyroid insufficiency. Several observers have drawn attention to the association of ichthyosis with this condition. Hertoghe has mentioned the occurrence of blepharitis.

The small stature and poor development of the limbs suggest that the trouble began in early adolescence, and this view is supported by the history of the case, which shows that the patient had been weak-minded for many years previous to admission.

Confirmation of the subthyroidic origin of the syndrome is furnished by the decided amelioration which results from the exhibition of thyroid extract in her case. Thus within three weeks of starting the treatment the ichthyosis and the general physical health had considerably improved, and there was also a remarkable change for the better in the mental state—the expression became more intelligent; attention was readily obtained and held; association was improved. The patient thanked me very much for ordering the tabloids, and said she woke in the morning feeling much refreshed and clearer in the head since taking them; she implored me to let her go on with the treatment. Besides

displaying more initiative in conversation her memory was improved, and she recalled without effort various events which had happened in the past.

CASE 13.—Dementia præcox, also shows some of the signs of subthyroidism, *e.g.*, small stature and poor development, the eyebrows are sparse in the outer third ("eyebrow sign"), eyes deep-set, small and lacking in expression, anorexia is a marked symptom.

CASE 15.—Dementia præcox, presents the eyebrow sign, coldness of the extremities, and a tendency to chilblains.

CASE 3.—Dementia præcox, shows the eyebrow sign, pulse 60 and small.

It is thus seen that all the four cases of dementia præcox included in the above table present, in a greater or less degree, stigmata of thyroid insufficiency.

In order to explain the association of goitre with dementia præcox as well as with congenital cases which was so striking in the statistics of Brissard and Schranz, it is necessary to consider the facts.

The thyroid gland not only governs the building up of the cells of the organism, including those of the central nervous system, but it also regulates their development.

In consequence of this there is an increased demand for thyroid secretion in infancy, early childhood, puberty, and adolescence. Owing, however, to the goitrous lesion the thyroid gland is naturally hampered in its endeavour to meet this demand. Should the weakened gland give way under the strain and its secretion become exhausted, disorganisation with auto-intoxication will result.

Now if this disorganisation occurs in infancy or early childhood it may conceivably give rise to imbecility, or even idiocy. On the other hand, if it be delayed to adolescence dementia præcox may result.

I have obtained a family history of goitre in three cases of dementia præcox, only one of whom presents some fulness of the neck, the other two show no thyroid enlargement at the present time :

The first is a male whose mother has a large goitre, and a maternal cousin has exophthalmic goitre ; in the second (male) the father and paternal uncle both suffer from goitre with exophthalmos. The third is a female whose paternal aunt has exophthalmic goitre.

In Case 2 (paranoia) the goitre is probably secondary to tuberculous disease of the spine with psoas abscess. There are signs pointing to hypothyroidism—scarcity of eyebrows, with chilliness and subnormal temperature.

The remaining two cases of paranoia are so suspicious and deluded that fuller examination is impracticable at present.

A study of the foregoing cases emphasises the great importance of heredity as an ætiological factor in thyroid abnormalities.

There are certain points of difference in the results of my observa-

tions as compared with those of Brissard and Schranz which need some explanation.

I have pointed out that the majority (70 *per cent.*) of my cases were manic-depressive or involuntional melancholiacs, and a minority (16.6 *per cent.*) were cases of dementia præcox.

On the other hand, Brissard and Schranz both found that the majority of their cases belonged to dementia præcox and congenital idiocy groups, the number of cases of manic-depressive insanity being comparatively small.

In my opinion, this disparity can be accounted for by the fact that sporadic goitre is more often accompanied by hyperthyroidism, and that this latter condition plays an important rôle in the production of manic-depressive insanity.

On the contrary, there is reason to believe that endemic goitre is associated with hypo-thyroidism, which condition appears to favour the onset of congenital idiocy and dementia præcox.

The absence of cases of congenital idiocy from the above table is due to the fact that such cases are not received into St. Andrew's Hospital.

*Ætiology of goitre.*—Before discussing the question of treatment it is essential to give a brief description of the ætiology of goitre.

Heredity is a most important factor, as will be seen by a reference to the cases I have described above. In many of these I have found a family history not only of goitre but of neuroses or psychoses.

Persons of an emotional or neurotic temperament are particularly prone to develop goitre.

Women are much more liable to this affection than men.

There are various circumstances and conditions which impose an extra strain on the thyroid gland, and may determine its enlargement. Thus a goitre may develop as a result of emotional states, *e.g.*, fear, anger, anxiety, etc., prolonged mental or physical stress, hygienic errors, deficient or improper food, puberty, menstruation, pregnancy, or sexual excess.

Enlargement of the thyroid gland in young girls has been particularly noticeable during the recent great European war—emotional and physical stress and the poorer standard of food probably acting as contributory factors.

Since the beginning of the war attention has been repeatedly drawn to the occurrence of goitre accompanied by symptoms of hyperthyroidism in men from 20 to 45 years of age. I have met cases of this kind who have been diagnosed "D.A.H.!" The cause is said to be chiefly emotional exhaustion, and in a lesser degree physical exhaustion.

A number of diseases and toxæmias are capable of causing hyper-

plasia of the thyroid gland, *e.g.*, rheumatic fever, measles, scarlet fever, pyorrhœa, tuberculosis, etc.

All these toxæmic conditions tend to weaken the secretory value of the thyroid gland, and may result in thyroid insufficiency.

Endemic goitre is supposed to be produced by a chronic toxæmia.

Pathological examination in the majority of cases of endemic goitre shows the thyroid gland to be in a state of colloid or fibrous degeneration which, we have seen, results in hypothyroidism.

#### TREATMENT.

In the ætiology of the psychoses associated with goitre it is important to realise that there are often two factors, a physical and a mental.

In the treatment of these psychoses the physical element should be dealt with before any special mental therapy is undertaken.

*Physical treatment.*—The importance of an early recognition of the somatic signs indicative of hypo- or hyperthyroidism cannot be too strongly emphasised.

*Hypothyroidism.*—If the physical signs point to this condition thyroid therapy should be at once commenced, and the greater the number of stigmata present the better the chance of success from this remedy. Quite small doses as a rule produce the best therapeutic effect. The pulse and weight must be carefully watched, and if any sign of hyperthyroidism appear the treatment should be suspended for a while. In any case it is well to suspend the drug for a few days about every tenth day and always during menstruation.

The treatment may have to be continued for years, and sometimes for a lifetime.

It is essential in every case of goitre to look for any possible source of toxic absorption; thus attention should be directed to the condition of the mouth, the state of the bowels; the diet should be regulated, any tubercular focus should be efficiently dealt with.

Where insufficiency of the other endocrinic glands is suspected suitable glandular extracts may be added to the treatment, but not before a thorough trial has been made with thyroid therapy alone.

The results of this treatment are often gratifying, not only from a physical point of view, but the mental symptoms may also be much ameliorated and cures may result.

*Hyperthyroidism.*—Although an extraordinary number of drugs have been tried in this condition, not one can lay claim to having a specific action. It should be mentioned, however, that calcium lactate (gr. 10 three times a day) has been used with some success, both in Graves' disease as well as in states of excitement.

Organotherapy has been employed, but hitherto without success; it would seem that our knowledge of the complicated interactions between the various endocrinic glands is as yet but imperfectly understood.

X-rays, surgical operations, and various other physical agents have their advocates, but in many cases they are not only useless but positively harmful.

*Mental treatment.*—Psychotherapy has recently been recommended in cases of Graves' disease, and there are three reasons which would seem to justify its employment in all cases of hyperthyroidism, *viz.* :

(1) The undoubted importance of the mental element (whether this be primary or secondary) in the ætiology of these cases.

(2) The predominance of nervous and mental symptoms in exophthalmic goitre.

(3) The failure of all other therapeutic measures (drugs and physical agents) to deal effectively with these cases.

Moreover, psychotherapy might usefully be employed in those cases of hypothyroidism in which thyroid treatment has proved inadequate in the removal of the mental symptoms.

There are two methods of applying psychotherapy, *viz.* (*a*) suggestion, and (*b*) the exploration of underlying mental conditions.

Psychotherapy has already been used with some success in certain cases of dementia præcox, of paranoia, and of manic-depressive insanity.

In the other psychoses this method of treatment is still in the embryonic stage, but, if one may judge by the progress made in the past, there is every reason to look forward to still further extensions of its applicability.

#### SUMMARY.

(1) We have seen the frequency with which goitre is associated with the psychoses—in a mental hospital receiving no cases of idiocy, one patient in every eight having some thyroid enlargement.

(2) As to the mechanism of this association we have seen that (*a*), goitre is, at some time in the patient's history, accompanied by a condition of hypo- or hyperthyroidism, and that (*b*) either of these conditions is capable of inducing a state of auto-intoxication with mental symptoms.

(3) My series of cases show that the nature of the psychosis is, in some degree, determined by the form of the functional disturbance of the thyroid gland, *e. g.*, hyperthyroidism is usually associated with states of excitement, agitation, etc. (*e. g.*, manic-depressive insanity), whereas hypothyroidism is more often associated with states of apathy and indifference (*e. g.*, dementia præcox).

(4) The treatment of the psychoses associated with goitre depends to some extent on the nature of the functional disturbance of the thyroid gland. If the signs point to hypothyroidism treatment by thyroid extract should be instituted. If hyperthyroidism is present the treatment should be directed to the removal of the mental element, which is now admitted to be of great importance in the ætiology of this condition. The only satisfactory method of accomplishing this is by the employment of psychotherapy.

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